Application No. 10/061,576
Filed: February 1, 2002
TC Art Unit: 3663
Confirmation No.: 9666

AMENDMENTS TO THE CLAIMS

1. (currently amended) ~~A~~ An adaptive downhole telemetry and power system for use in an environment ~~with~~ comprising a borehole extending into a formation, the borehole including a casing positioned within the borehole and a piping structure contained within the casing, the system comprising:

a surface data processor operative to provide first data and commands in a ~~digital~~ data packet format, the data packet format including at least one field allocatable for executable digital signal processing code;

a surface modem having an input coupled to the surface data processor and an output coupled to the casing and piping structure, the surface modem operative to modulate a first signal having a first frequency band with the first data and commands received from the surface data processor in a first modulation scheme to provide a first transmitted command and data signal;

a downhole modem coupled to the casing and piping structure and configured and arranged to receive the ~~transmitted~~ first command and data signal, the downhole modem operative to demodulate the first modulation scheme, and to recover the ~~downhole transmitted~~ first data and commands including the executable code;

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

a retentive memory operative to store the recovered first data and commands including the executable code; and

a downhole processor coupled to the retentive memory and to the downhole modem, the downhole processor operative to receive the recovered first data and commands from the downhole modem, and to store the recovered first data and commands including the executable code in the retentive memory~~.~~,

~~whereby~~ wherein at least one of the downhole modem and the downhole processor is further operative to be reprogrammed with the executable code ~~from~~ by the surface data processor ~~using the transmitted data and commands~~, and to implement the executable code for performing at least one algorithm to adapt the system to the borehole environment.

2. (original) The system of claim 1 wherein the retentive memory is a FLASH memory.

3. (currently amended) The system of claim 1 wherein the transmitted data and commands ~~can~~ include new receive and transmit carrier frequency values, and wherein at least one of the downhole modem and the downhole processor is operative to implement the

HEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

executable code for performing at least one algorithm to conform to the new receive and transmit carrier frequency values.

4. (currently amended) The system of claim 1 wherein the transmitted data and commands ~~can~~ include a new modulation structure, and wherein at least one of the downhole modem and the downhole processor is operative to implement the executable code for performing at least one algorithm to conform to the new modulation structure ~~the appropriate executable digital signal processing code to process same~~.

5. (currently amended) The system of claim 1 wherein the transmitted data and commands ~~can~~ include a symbol rate value, and wherein at least one of the downhole modem and the downhole processor is operative to implement the executable code for performing at least one algorithm to conform to the symbol rate value.

6. (currently amended) The system of claim 1 wherein the transmitted data and commands ~~can~~ include a new address value.

EINGARTEN, SCHUHGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

Application No. 10/061,576
Filed: February 1, 2002
TC Art Unit: 3663
Confirmation No.: 9666

7. (currently amended) The system of claim 1 wherein the transmitted data and commands ~~can~~ include new values of parameters associated with ~~the~~ relaying of messages.

8. (currently amended) The system of claim 1 wherein the first transmitted data and commands ~~can~~ include changes to the ~~one or more bit~~at least one ~~fields~~ field contained within the ~~communications~~ data packet format.

9. (currently amended) The system of claim 1 wherein the first transmitted data and commands ~~can~~ include ~~any~~ internal variables and coefficients which form part of the modem processing~~.~~.

10. (currently amended) The system of claim 1 further including a surface retentive memory coupled to the surface data processor, wherein the surface retentive memory is configured and arranged to receive third data and commands from a data source.

11. (original) The system of claim 10 wherein the data source is data transmitted over the Internet.

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

12. (original) The system of claim 10 wherein the data source is data transmitted over a company intranet.

13. (currently amended) The system of claim 10 wherein the third data and commands ~~can~~ include new receive and transmit carrier frequency values.

14. (currently amended) The system of claim 10 wherein the third data and commands ~~can~~ include a new modulation structure, and wherein at least one of the downhole modem and the downhole processor is operative to implement the executable code for performing at least one algorithm to conform to the new modulation structure ~~the appropriate executable digital signal processing code to process same~~.

15. (currently amended) The system of claim 10 wherein the third data and commands ~~can~~ include a symbol rate value.

16. (currently amended) The system of claim 10 wherein the third data and commands ~~can~~ include a new address value.

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

17. (currently amended) The system of claim 10 wherein the third data and commands ~~can~~ include new values of parameters associated with ~~the~~ relaying of messages.

18. (currently amended) The system of claim 10 wherein the third data and commands ~~can~~ include changes to the ~~one or more bit fields~~at least one field contained within the ~~communications~~ data packet format.

19. (currently amended) The system of claim 10 wherein the ~~transmitted~~ third data and commands ~~can~~ include ~~any~~ internal variables and coefficients which form part of the modem processing~~.~~.

20. (original) The system of claim 10 wherein the data source is the surface data processor.

21. (new) The system of claim 10 wherein the data source is the downhole processor.

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

22. (new) The system of claim 1 wherein the first modulation scheme comprises 16-point quadrature amplitude modulation (16 QAM).

23. (new) The system of claim 1 wherein the downhole modem is further operative to modulate a second signal having a second frequency band with second data received from the downhole processor in a second modulation scheme to provide a second transmitted data signal.

24. (new) The system of claim 23 wherein at least one of the downhole modem and the downhole processor is further operative to implement the executable code for performing at least one algorithm to conform to the second modulation scheme.

25. (new) The system of claim 23 wherein the downhole modem is further operative to modulate the second signal using at least one of quadrature phase shift keying (QPSK) and orthogonal frequency division multiplexing (OFDM).

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313